History of Banking

A short history of banking

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History of Banking: a subjective selection

Early Developments

Grain loans supported agriculture

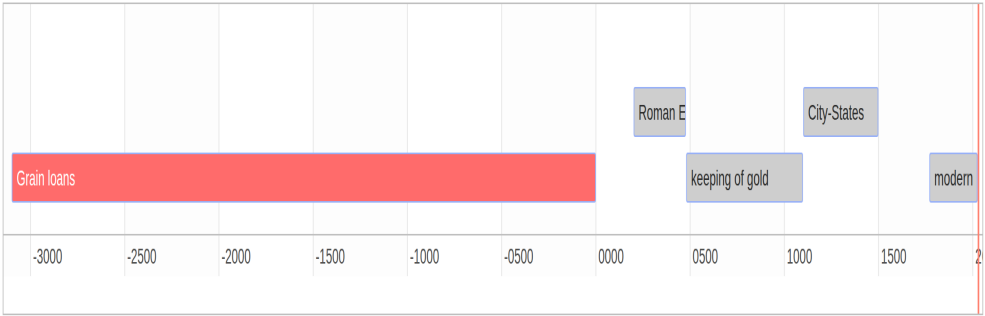

Figure: The timeline of banking shows a long and stable phase in agrarian societies.

Mesopotamia 2,000 BCE

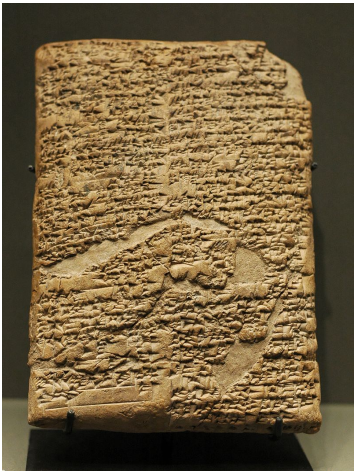

Figure: The Hammurabi Code (Law 100) describes interest-bearing loans. Commissioned by Hammurabi, the king of Babylon (ca. 1792–1750 BCE) – source: `wikimedia.org`

Jesus of Nazareth flips over tables and whips money changers and merchants

Figure: Christ driving the money changers from the temple by Jan Sanders van Hemessen. – source `wikimedia.org`

Bankers in Ancient Rome

- **Professional Bankers** distinct social group (*equites* class).
- **Public Bankers (*Mensarii*)**
  - State-appointed officials (economic stability).
  - Public loans from the treasury (*aerarium*) (from crisis in 352 BC).
- **Currency Controllers (*Nummularii*)**
  - Test coins and manage currency circulation (1st century BC – 4th century AD).
- **Private Bankers (*Argentarii*)**
  - Freemen in a professional guild (*collegium*).
  - Operated *tabernae argentariae* (banking shops) offering credit and financial services (mid-2nd century BC – mid-2nd century AD).

Social Status

Successful bankers gained wealth and influence.

money transfers - Permutatio

move large sums across distances by adjusting bank ledgers

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Early Middle Ages in Europe

The Dark Ages

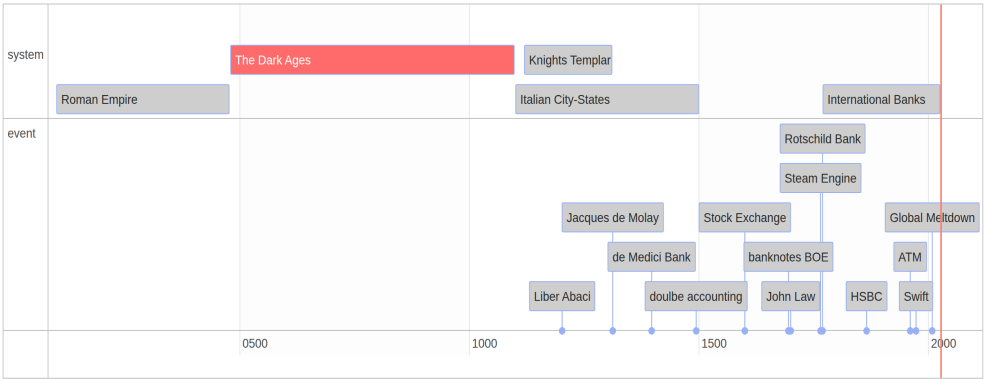

Figure: Balance Sheet more than 4,000 years old.

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Late Medieval Europe

The late medieval period

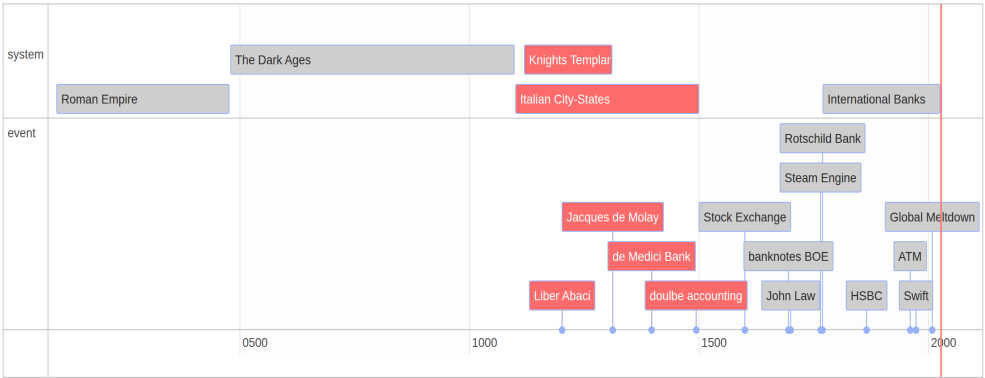

Figure: The late middle ages saw steady progress in science, trade, and economic development.

Liber Abaci: progress from mathematics

Figure: “Liber Abaci” (1202) by Leonardo di Pisa (posthumously Fibonacci) introduces the Modus Indorum, the Hindu–Arabic numeral system (base-10 notations) in section 1. In section 2 the advantages for business problems: currency conversions, profit and interest calculations -

The real bankers: The Knights Templar

The Medici

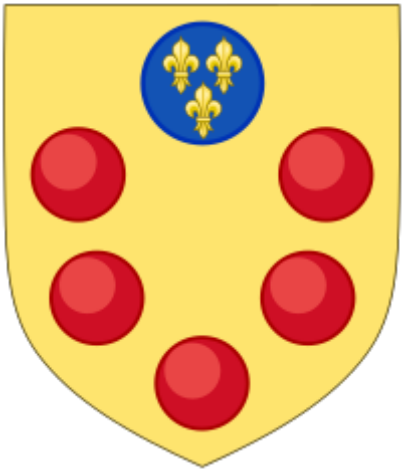

Figure: The Medici Dynasty power and influence beyond comparison through local in Italy - bank created by Giovanni de Medici in the 15th century.

Shares and stock exchange

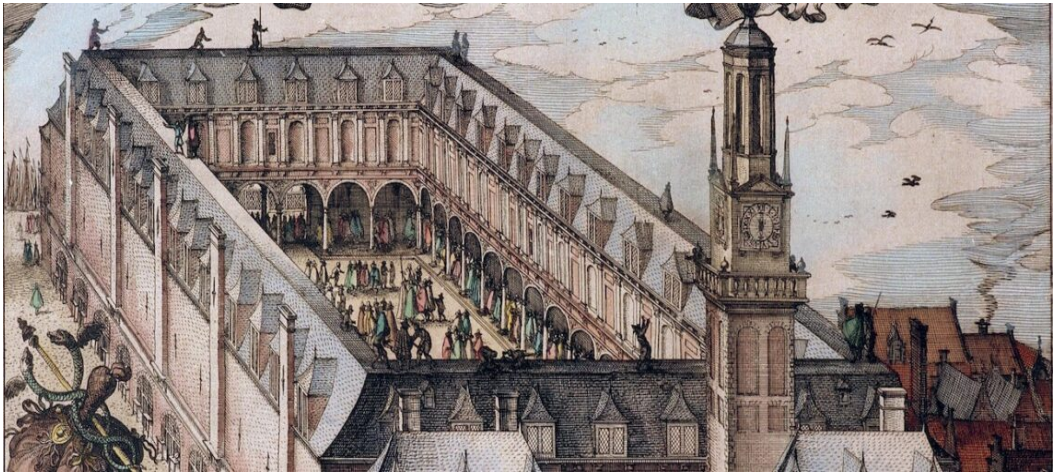

Figure: The Amsterdam Stock Exchange: 1602.

Shakespeare's Merchant of Venice

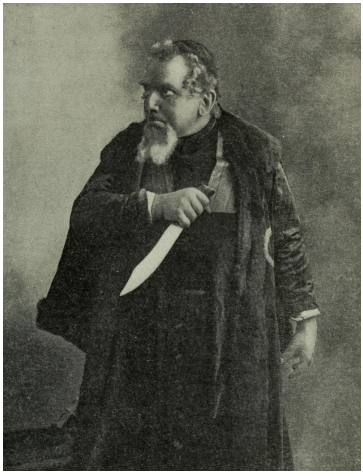

Figure: Ernst von Posart as Shylock in Shakespeare's play "The Merchant of Venice" (ca. 1600). – image `wikimedia.org`

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Modern Times

Modern Times

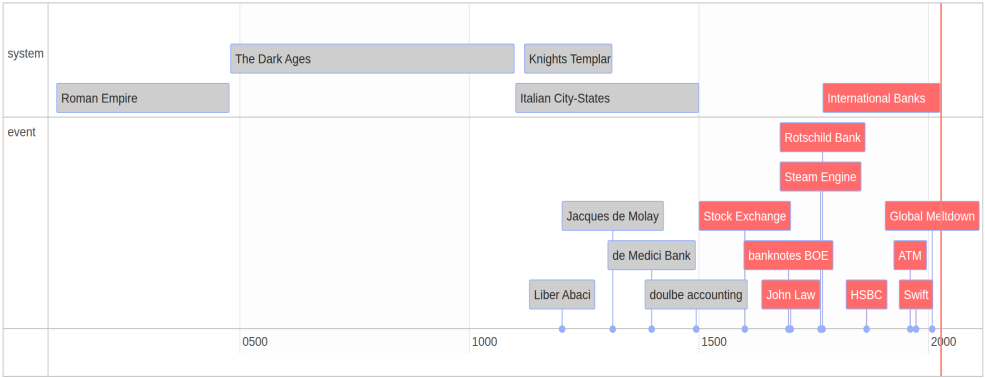

Figure: Balance Sheet more than 4,000 years old.

Mayer Amschel Rotschild

Figure: Mayer Amschel Rothschild re-invents international banking – The Internationalisation of the bank ca. 1770.

The last piece of the puzzle

Figure: The last piece of the puzzle: energy rich food with the potato. From the end the 16th century (via Spain around 1570, and via the British Isles between 1588 and 1593).

The Motor: the Scientific Method

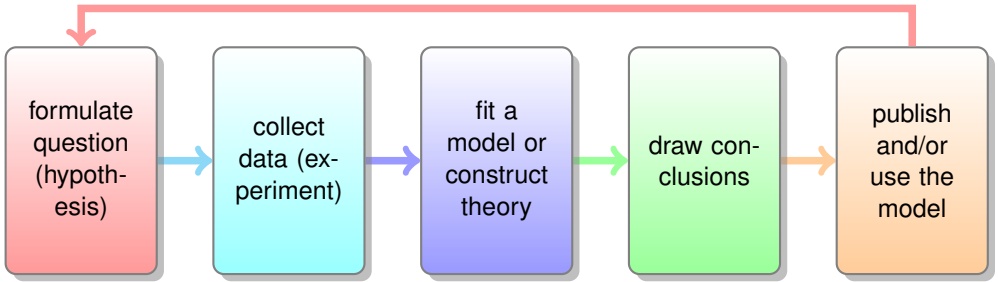

Figure: The steps in the scientific method for the data scientist as commonly in use from the 19th century, long after the work of Ibn al-Haytham (aka Alhazen — 965–1039, Iraq).

Cycles of Capitalism

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Cycles of Capitalism

The Steam Engine

The steam engine provides power for factories and fuelled unprecedented economic growth

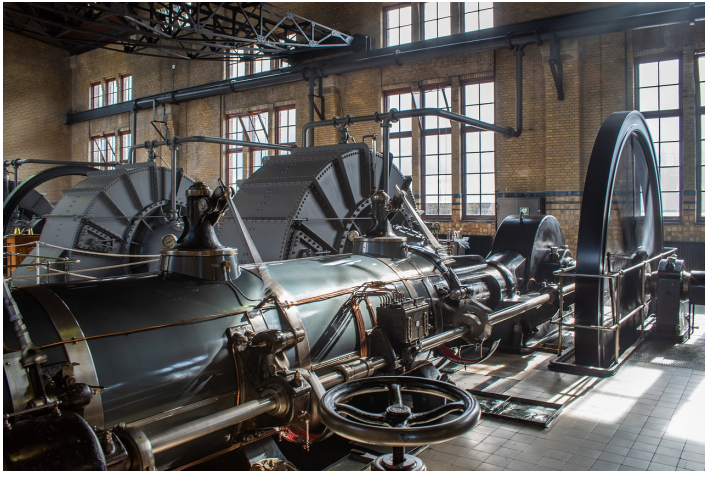


Figure: Steam Engine in factory — image by Kobus van Leer from `pixabay.com`

The Steam Engine

Key dates

- Taqi al-Din in 1551 and Giovanni Branca in 1629 describe a steam engine
- Thomas Savery (1698) invents steam pump and in 1712 Thomas Newcomen invents the first practical steam engine
- invention of the steam engine with separate condenser by James Watt in 1765
- Ivan Polzunov (1766) builds the first two-cylinder steam engine
- explosive economic growth since the early 1800s
- The “Panic of 1857”, 1866, and “The Panic of 1873”, that initiated the “Long Depression”
- Karl Marx writes “Das Kapital” in 1867

Cycles of Capitalism

The Train

The Train

Figure: The Train provided reliable mass transport — image Image by Erich Westendarp from pixabay.com

The Train

Key Dates

- 1804: first train (it pulled 25 tonnes of iron material and 70 people over the distance of 10 miles)
- First commercial steam train (Stephenson's "The Rocket") managed to reach speed of 96 km/h.
- about 40% of the world's cargo go still by train (ecological and efficient)
- end: "The Panic of 1901" and ultimately WWI

The Internal Combustion Engine, Electricity and Magnetism

The Internal Combustion Engine

Fuelled exponential economic growth and provided individual transport

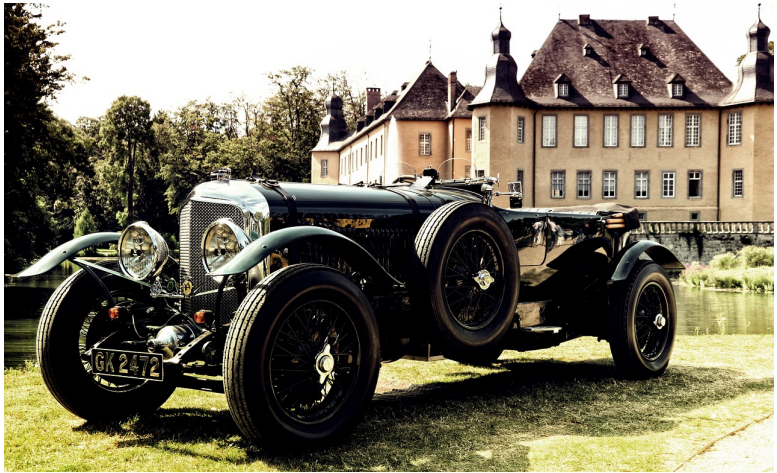


Figure: The internal combustion engine gave rise to reliable individual transport — image by S. Hermann & F. Richter from `pixabay.com`

Electricity and Magnetism

Fuelled exponential economic growth and provided a plethora of applications and appliances

Figure: Electricity and Magnetism provided lightbulbs, radio, and all kinds of powered appliances — image by PublicDomainPictures from pixabay.com

The Internal Combustion Engine, Electricity and Magnetism

Key Dates

- 1805 Humphry Davy invents the “carbon ark” (electric light)
- 1832: first DC electro-motor (William Sturgeon); 1837
- 1885: first practical gasoline automobile by Karl Benz
- Ford T (since 1908)
- Automation both at home and in the factory due to electricity and magnetism
- end: “Wall Street Crash of 1929”, that initiated the “Great Depression” and ultimately WWII.

Automobiles and the Petro-Chemical Industry

Fuelled exponential economic growth

Figure: The petro-chemical industry — image by Frauke Feind from `pixabay.com`

Automobiles and the Petro-Chemical Industry

Key Dates

- 1600 BCE: Mesoamericans used natural rubber for balls, bands, and figurines
- First oil wells in USA (1846), Poland (1853), Romania (1857)
- 1856: first man-made plastic by Alexander Parkes
- First modern oil well (1854) and first oil refinery (1856) by Ignacy Łukasiewicz
- 1872: invention of polyvinyl chloride (PVC)
- 1923: Durite Plastics Inc. produced phenol-furfural resins
- 1930s: production of polystyrene (PS) and PVC by BASF
- 1933: polyethylene discovered by Imperial Chemical Industries (ICI) – Reginald Gibson and Eric Fawcett.
- 1941: polyethylene terephthalate (PET) discovered by Calico Printers' Association (a replacement for glass in many applications)
- 1954: polypropylene by Giulio Natta
- 1957: production of polypropylene
- 1954: expanded polystyrene (building insulation, packaging, and cups) invented by Dow Chemical.
- end: 1973–74 stock market crashes

Cycles of Capitalism

The Electronic Computer and the Internet

The Electronic Computer

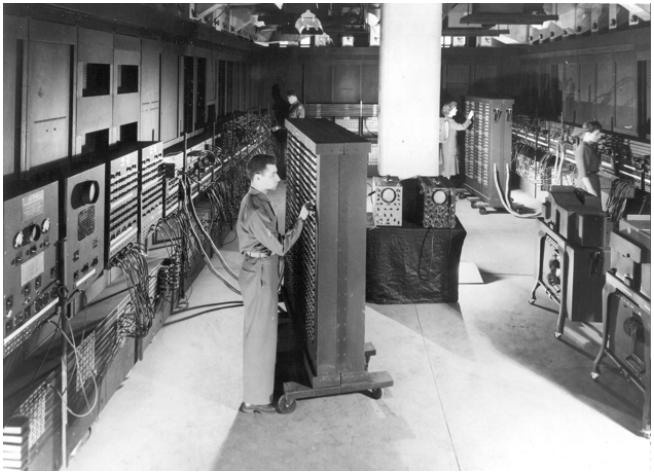


Figure: The ENIAC (Electronic Numerical Integrator and Computer) — image by Unidentified U.S. Army photographer - Public Domain

The Computer: Key Dates

- Charles Babbage's Analytical Engine (1830s) and Ada Lovelace's code for it in 1843
- first computers: ABC in 1942, Collossus 1943
- 1946: ENIAC, first programmable general purpose computer
- 1952: IBM sells first mainframe
- 1953: Hard-disk
- 1959: metal–oxide–semiconductor field-effect transistor (MOSFET), invented by Mohamed Atalla and Dawon Kahng
- 1968: Network of Networks (UCLA) with Telnet, FTP, messaging and email — The ARPA-net in 1977 (now "the Internet")
- 1973: C (by Dennis Ritchie in the Bell Labs)
- 1980: DOS
- 1989: WWW is developed and used in CERN
- 1993: IBM Simon (first smart-phone)
- 2000: Nokia 3310
- end: Dot-Com Bubble of 2000 and the 2008 Global Meltdown

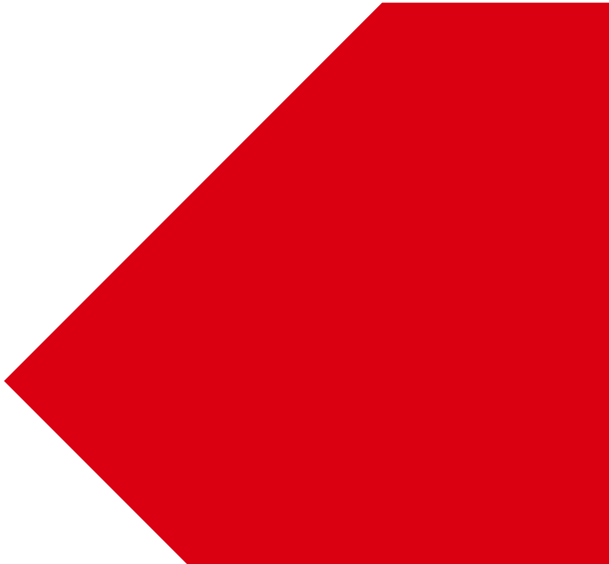
Cycles of Capitalism

Artificial Intelligence

Artificial Intelligence

Figure: Artificial Intelligence is the next industrial wave.

Modern Banks



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How banks opearate

How banks operate

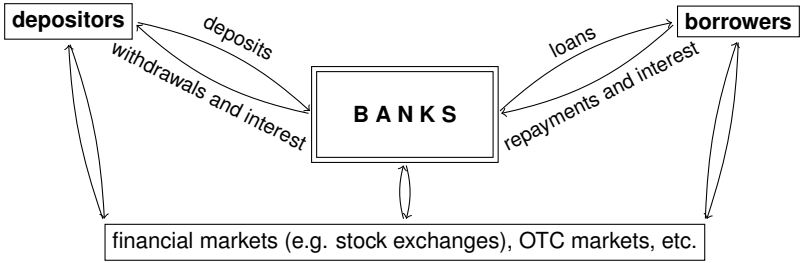


Figure: The role of banks

Overview of Banking Institutions

Global Universal Banks

- **What they do:**
  - Offer a full range of services worldwide: retail, commercial, and investment banking.
- **Unique characteristics:**
  - Massive scale and global reach.
  - Integrated financial service models.
  - Significant systemic importance.
- **Role in system:**
  - Facilitate international trade and capital flows.
  - Serve multinational corporations and global clients.

Examples:

- HSBC (Global)
- BNP Paribas (France/Global)
- Deutsche Bank (Germany/Global)
- Santander (Spain/Global)

Commercial Banks

- **What they do:**
  - Serve businesses and corporations.
  - Business loans, treasury services.
- **Unique characteristics:**
  - Focus on business cash flow and needs.
  - Larger transaction sizes.
- **Role:** Fund business operations and growth.

Examples:

- Bank Pekao (Poland)
- ING Bank Ślaski (Poland/Netherlands)
- Commerzbank (Germany)

Retail Banks

- **What they do:**
  - Serve individual consumers.
  - Basic accounts, savings, personal loans, mortgages.
- **Unique characteristics:**
  - Extensive branch/ATM networks.
  - High-volume, low-value transactions.
- **Role:** Main banking access for the public.

Examples:

- PKO BP (Poland)
- mBank (Poland)
- Barclays (UK)
- Société Générale (France)

Investment Banks

- **What they do:**
  - Capital raising (IPOs, bonds).
  - Mergers & Acquisitions (M&A) advice.
  - Securities trading.
- **Unique characteristics:**
  - Fee-based revenue model.
  - Serve corporations, governments, institutions.
- **Role:** Facilitate complex financial transactions.

Examples:

- Goldman Sachs (USA/Global)
- Rothschild & Co (France/Global)
- Dom Maklerski PKO BP (Poland)

Central Banks

- **What they do:**
  - Set monetary policy (interest rates).
  - Supervise the banking system.
  - Ensure financial stability.
- **Unique characteristics:**
  - Sole authority to issue currency.
  - Lender of last resort.
  - Non-profit, public institution.
- **Role:** Macroeconomic management.

Examples:

- European Central Bank (Eurozone)
- Narodowy Bank Polski (Poland)
- Bundesbank (Germany)

Cooperative Banks

- **What they do:**
  - Provide banking services to members.
  - Often community or profession-focused.
- **Unique characteristics:**
  - Customer-owned (member-owned).
  - "One member, one vote" governance.
- **Role:** Support local communities and members.

Examples:

- Credit Agricole (France)
- DZ Bank (Germany)
- Spółdzielcza Kasa Oszczędnościowo-Kredytowa (SKOK) (Poland)

Credit Unions

- **What they do:**
  - Provide retail banking to a member group (e.g., employees, residents).
- **Unique characteristics:**
  - Not-for-profit, member-owned.
  - Common bond requirement for membership.
- **Role:** Financial cooperation for a specific group.

Examples:

- Less common in Poland.
- Popular in North America.

Savings and Loan Associations

- **What they do:**
  - Specialize in residential mortgages.
  - Accept consumer deposits.
- **Unique characteristics:**
  - Historical focus on home financing.
  - Mutual ownership structure.
- **Role:** Promote home ownership.

Examples:

- Less distinct in Europe today.
- Many evolved into universal banks.
- (Historically prominent in the USA)

Islamic Banks

- **What they do:**
  - Provide Sharia-compliant financial services.
  - Use profit-sharing instead of interest.
- **Unique characteristics:**
  - Prohibition of interest (riba).
  - Asset-backed financing.
- **Role:** Serve Muslim populations ethically.

Examples:

- Kuveyt Türk (Turkey)
- Al Rayan Bank (UK)
- (Niche presence in Europe)

The size of banks is considerable

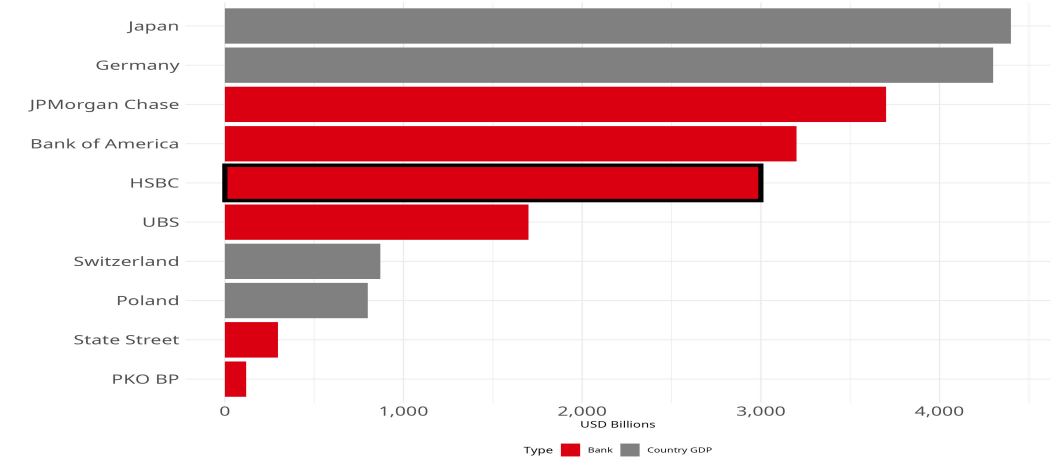
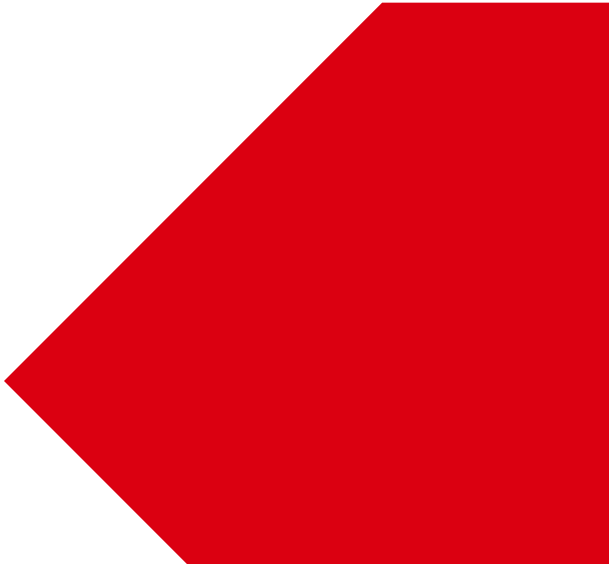


Figure: Balance Sheet of some banks compared to the GDP of some countries.

Conclusions



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Conclusions: Banking - Past, Present & Future I

Key Insights from Historical Evolution to Modern Challenges

Historical Legacy Meets Digital Future

- Banking evolved from **temple repositories** to **global digital platforms**, yet core principles of trust and intermediation remain the same
- Banks were one of the enablers of each technological revolution (**steam, electricity, computing**) that gradually transformed banking's scale and scope
- Today's large banks operate at sizes similar to **national economies** - HSBC's balance sheet exceeds Poland's GDP
- **Cyclical nature of capitalism**: Innovation $\rightarrow$ expansion $\rightarrow$ Crisis $\rightarrow$ Regulation $\rightarrow$ Reform
- **Banks are crucial to economies**: challenges to keep them save.

Conclusions: Banking - Past, Present & Future II

Key Insights from Historical Evolution to Modern Challenges

Future Frontiers

- **Digital transformation**: AI and quantum computing will reshape finance and banking

The Constant: Trust remains banking's ultimate currency

From temple grain stores to digital assets - the foundation never changes: trust

Nomenclature I

AI	Artificial Intelligence, page 40
BASF	Badische Anilin und Soda Fabrik, page 35
BCE	before common era, page 35
DOS	disc operating system, page 38
ENIAC	Electronic Numerical Integrator and Computer, page 37
FTP	file transfer protocol, page 38
IBM	International Business Machines Corporation, page 38
MOSFET	metal–oxide–semiconductor field-effect transistor, page 38
PS	polystyrene, page 35
PVC	polyvinyl chloride, page 35
UCLA	The University of California, Los Angeles, page 38
WWI	World War I, page 29
WWW	world wide web, page 38

Thank you for your attention!

handouts

Philippe’s business card